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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-----------------------------|------------------|
| 10/532,827 | 04/26/2005 | Naoki Hase | 052478 | 8889 |
| 38834 7590 01/09/2007 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036 | | | EXAMINER GOFF II, JOHN L | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1733 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 01/09/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/532,827

Applicant(s)

HASE ET AL.

Examiner

John L. Goff

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 4/26/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 3-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Hase et al. (WO 01/32418 with U.S. Patent 7,101,455 used as a translation).

Hase et al. disclose a method of producing a laminate without wrinkles suitable for use as a circuit board comprising providing a heat-resistant film including a resin containing a thermal fusible component (2 of Figure 1(a)), providing upper and lower metallic foils (1 of Figure 1(a)) (e.g. copper or steel), providing protective materials (3 of Figure 1(a)), laminating the film, foils, and protective materials by pressing the substrates in a heated roll laminating apparatus (4 of

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Figure 1(a)) operated at 200 °C or higher to form a laminate (6 of Figure 1(a)) of the film bonded to the foils and the protective materials slightly contacted with the laminate, cooling the laminate, and removing the protective materials from the laminate (8 of Figure 1(a)) (Figure 1(a) and Column 4, lines 13-19 and Column 8, lines 16-39 and Column 11, lines 39-61). Regarding the limitation of the temperature of the ends, i.e. the lateral edges, of the laminate as the same as the center portion in the cooling process, it is noted Hase et al. teach that during lamination in the heated roll laminating apparatus the laminate is uniformly heated (Column 4, lines 20-24 and Column 15, lines 58-61) such that the laminate at least at the beginning of the cooling process directly following lamination is considered to have the same temperature at its ends and center such that the limitation is met.

Regarding claim 5, Hase et al. teach the heat-resistant film may comprise a multilayer of a non-thermoplastic polyimide film having thermoplastic polyimide layers, i.e. a resin containing a thermally fusible component, provided on upper and lower surfaces thereof (Column 11, lines 39-61).

Regarding claim 6, Hase et al. teach the thermally fusible component of the heat-resistant film contains a thermoplastic polyimide in an amount of 50% by weight or more based on 100% by weight of the thermally fusible component (Column 5, lines 46-49).

Regarding claim 7, Hase et al. teach the metallic foil may comprise a copper foil having a thickness of 50 μm or less (Column 13, lines 24-30).

Regarding claim 8, Hase et al. teach the protective material may a non-thermoplastic polyimide film (Column 10, lines 1-10 and Column 11, lines 39-61 and Column 26, lines 49-50).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. in view of Iizuka et al. (JP 2002172639 and see also the machine translation) and Okochi et al. (JP 04080348 and see also the abstract).

Hase et al. disclose a method of producing a laminate without wrinkles suitable for use as a circuit board comprising providing a heat-resistant film including a resin containing a thermal fusible component (2 of Figure 1(a)), providing upper and lower metallic foils (1 of Figure 1(a)) (e.g. copper or steel), providing protective materials (3 of Figure 1(a)), laminating the film, foils, and protective materials by pressing the substrates in a heated roll laminating apparatus (4 of Figure 1(a)) operated at 200 °C or higher to form a laminate (6 of Figure 1(a)) of the film bonded to the foils and the protective materials slightly contacted with the laminate, cooling the

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lamine, and removing the protective materials from the lamine (8 of Figure 1(a)) (Figure 1(a) and Column 4, lines 13-19 and Column 8, lines 16-39 and Column 11, lines 39-61). Hase et al. are silent as to the temperature of the ends, i.e. lateral edges, of the lamine being higher than that of the center portion in the cooling process, it being noted Hase et al. teach the cooling may be performed by contacting the lamine with a substrate of lower temperature (Column 8, lines 29-39). Iizuka et al. disclose a method of producing a lamine without wrinkles suitable for use as a circuit board comprising providing a layup of a resin layer sandwiched between metallic foils (e.g. copper foils), laminating the layup by pressing the layup at a laminating temperature, and cooling the lamine by contacting the lamine with a cooling substrate which provides more cooling at the center of the lamine and less cooling at the ends of the lamine, i.e. the temperature of the ends of the lamine is higher than that of the center portion in the cooling process, to prevent the lamine from wrinkling during cooling (Figures 1(a) and 1(c) and Paragraphs 2, 7, 9, 10, and 15). Furthermore, it is well taken in the art of cooling a heated metallic sheet, e.g. steel, by contacting the sheet with a cooling substrate that cooling is performed by providing more cooling at the center of the sheet and less cooling at the ends of the sheet so that the temperature at the center of the sheet is lower than the temperature at the ends of the sheet to prevent the sheet from wrinkling as shown by Okochi et al. wherein the temperature difference between the center and ends of the sheet is 30 to 60 °C (See the abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to cool the lamine including metallic foils as taught by Hase et al. by contacting the lamine with a cooling substrate that provides more cooling to the center of the lamine and less cooling to the ends, i.e. lateral edges, of the lamine, i.e. the temperature of the ends of the lamine is the

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higher than that of the center portion in the cooling process, as shown by both Iizuka et al. and Okochi et al. to ensure the laminate is formed without wrinkles.

Regarding claim 2, as to the temperature of the ends of the laminate being 40 °C higher than the center of the laminate, absent any unexpected results it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the temperature difference between the ends and center of the laminate taught by Hase et al. as modified by Iizuka et al. and Okochi et al. as a function of preventing wrinkling in the laminate as doing so would have required nothing more than ordinary skill and routine experimentation, it being noted Okochi et al. specifically suggest this difference is within the range of 30 to 60 °C.

Regarding claim 5, Hase et al. teach the heat-resistant film may comprise a multilayer of a non-thermoplastic polyimide film having thermoplastic polyimide layers, i.e. a resin containing a thermally fusible component, provided on upper and lower surfaces thereof (Column 11, lines 39-61).

Regarding claim 6, Hase et al. teach the thermally fusible component of the heat-resistant film contains a thermoplastic polyimide in an amount of 50% by weight or more base on 100% by weight of the thermally fusible component (Column 5, lines 46-49).

Regarding claim 7, Hase et al. teach the metallic foil may comprise a copper foil having a thickness of 50 µm or less (Column 13, lines 24-30).

Regarding claim 8, Hase et al. teach the protective material may comprise a heat resistant polyimide film which is considered a non-thermoplastic polyimide film (Column 10, lines 1-10 and Column 11, lines 39-61 and Column 26, lines 49-50).

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1, 2, and 5-8 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 7,101,455 in view of Iizuka et al. and Okochi et al. Claims 1-4 of U.S. Patent No. 7,101,455 fully encompass claims 1, 2, and 5-8 of the instant application except for a teaching that the temperature of the ends of the laminate is the same as or higher than that of the center portion in the cooling process which is obvious in view of Iizuka et al. and Okochi et al. as described above. Regarding claim 7, claims 1-4 of U.S. Patent No. 7,101,455 are silent as to the metal comprising copper foil. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the metal layer in claims 1-4 of U.S. Patent No. 7,101,455 a copper foil as was the preferred metal layer for forming a substrate useful as a circuit board as shown by Iizuka et al. wherein absent any unexpected results it would have been obvious to one of ordinary skill in the art to determine

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the specific thickness of the foil as a function of the specific use of the circuit board as doing so would have required nothing more than ordinary skill and routine experimentation.

9. Claims 3 and 4 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 7,101,455, Iizuka et al., and Okochi et al. as applied to claims 1, 2, and 5-8 above, and further in view of Tokabayashi et al. (JP 04033848). Claims 1-4 of U.S. Patent No. 7,101,455, Iizuka et al., and Okochi et al. as described above fully encompass claims 3 and 4 except for a specific teaching of using a heated roll laminating apparatus as the thermal-press forming device. Tokabayashi et al. are exemplary of laminating copper foils and a heat-resistant film in the formation of a circuit board wherein the foils and film are laminated in a heated roll laminating apparatus (See the abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the thermal-press forming device taught by claims 1-4 of U.S. Patent No. 7,101,455 as modified by Iizuka et al., and Okochi et al. a heated roll laminating apparatus as shown by Tokabayashi et al. to continuously form the laminate.

10. Claims 1-8 are directed to an invention not patentably distinct from claims 1-4 of commonly assigned U.S. Patent No. 7,101,455. The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned U.S. Patent No. 7,101,455, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C.

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103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C. 103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

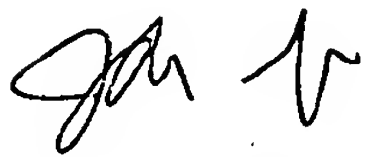
Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John L. Goff** whose telephone number is **(571) 272-1216**. The examiner can normally be reached on M-F (7:15 AM - 3:45 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



John L. Goff